F.Y.B.Com (Semester - II) Semester End Assessment, June 2022 (Repeat)
Subject: Commercial Arithmetic – II

Time: 02 Hours Max. Marks: 80

Instructions: 1. All questions are compulsory however internal choice is available.
2. Use of calculator is strictly forbidden.
3. Figures to the right indicate marks allotted.
4. There are 4 main questions each carrying 20 marks.
5. You may answer randomly but every main question attempted should be answered serially.

Q.1) Attempt the following: **(4 x 5 = 20)**

a) Show that ABC is a right angled triangle where A= (2, 6), B= (3, -1) and C= (-1, 2).
b) If A = {1, 2, 3, 4}, B = {0, 1, 2,..., 10} and R is relation from A to B such that R = {(1,9), (2, 8), (3, 7), (4, 6)}. State Domain (D), Range(R) and the type of correspondence. Is it a function? If yes, into or onto function?
c) Find $\frac{dy}{dx}$ for following functions: (i) $y = x^{-3} + x^4 + 9x$ (ii) $y = (x^2 - 1)(x^2 + 1)$
d) Show that ABCD is a parallelogram where A= (3, -3), B= (5, 8), C= (4, 7) and D= (2, -4).

OR

Q.I) Attempt the following: **(4 x 5 = 20)**

p) Show that PQR is a right angled triangle where P= (3, -5), Q= (5, -4) and R = (6, -2).
q) If $g(x) = x^2 - 2x^3 - 5e^x$, then find g(0), g(1), g(-1) and g(-2).
r) If $f(x) = 5x^4$ and g(x) = 3x, show that f(x) is even function and g(x) is odd function.
s) Divide segment AB in two equal parts where A= (- 6, 7) and B= (2, - 4).

Q.2) Attempt the following: **(4 x 5 =20)**

a) If A= (1, -3), B= (2, 1). Then find equation of line parallel to AB and passing through (-1, 2).
b) Find $\lim_{x \to 1}\left(\frac{4x^2 + x - 5}{x^2 - 7x + 6}\right)$.
c) Let A= {1, 2, 3, 4} and B= {1, 2, 4, 6, 7, 9, 10}. Let R = {(1, 4), (2, 7), (3, 2), (4, 6)}. Is R a relation from A to B? if yes, mention the type of correspondence and into or onto.
d) The ratio of two numbers is 5:6. On subtracting 6 from each of these numbers, the ratio becomes 4:5. Find the numbers.

OR

Q.II) Attempt the following: **(4 x 5 = 20)**

p) Show that the lines 5x - y +7 = 0 and 5y + x + 11 = 0 are perpendicular to each other.
q) Examine continuity of f(x) at x = 2, where $f(x) = \begin{cases} 1 - x^2, & x \leq 2 \\ x - 6, & x > 2 \end{cases}$
r) If $f(x) = 1 + x - x^2$, find the values of f(x) when x = -1, 1, -2, 2.
s) Monthly incomes of two persons A and B are in the ratio of 3:2 and their expanses are in the ratio 2:1. If each of them saves ₹ 10,000 per month, find their monthly income.

(4 x 5 = 20)

Q.3) Attempt the following:

a) Solve the following LPP by graphical method.

Maximize $z = 5x + 3y$ subject to

$2x + y \geq 9$

$3x + 2y \geq 16$, where $x \geq 0$, $y \geq 0$.

b) Find derivative of y where $y = 3\log(x) + x^3 + x^2 + 1$.

c) If 10 men can complete the piece of work in 50 days, then 16 men will complete the same job in how many days?

d) Find the following: (i) 25% of 5.2 meter.
(ii) The number whose 15% is 36.

OR

(4 x 5 = 20)

Q.III) Attempt the following:

p) Solve the following LPP by graphical method.

Minimize $z = 5x + 2y$

subject to $5x + y \geq 10$

$x + y \geq 6$; $x \geq 0, y \geq 0$.

q) If $f(x) = 3x + x^3 - e^x$, then find $f(1)$ and $f'(1)$.

r) The monthly incomes of x and y are in the ratio 4:5, their expenses are in the ratio 7:9 and their savings are in the ratio 4:3. If their total savings is ₹ 350, find their individual monthly income.

s) 20% of a number added to 48, gives the same number. Find the number.

(4 x 5 = 20)

Q.4) Attempt the following:

a) If A is (2, 3) and B is (-3, 5), find mid-point of AB and slope of AB.

b) Find $\lim_{x \to 2}\left(\frac{x^3 - 2x + 4}{x^2 + 5x - 2}\right)$

c) If cost of 20 books is Rs. 720. Find the cost of one book. How much we have to pay for 50 books?

d) Sameer purchased a car for Rs, 4,50000 and sold it for Rs. 3,00000. Find the loss percent.

OR

Q.IV) Attempt the following: **(4 x 5 = 20)**

p) If the lines $x + 2y - 1 = 0$ and $kx + 3y + 1 = 0$ are parallel to each other then find the value of k.

q) Find $\lim_{x \to 3}\left(\frac{x^2 - 4x + 4}{x^2 + x - 21}\right)$

r) If a fridge of Rs. 50,000 is been sold for Rs. 55,000, find the profit percentage.

s) The listed price of an article is Rs. 3500. If discount of 12% is allowed to the buyer, how much will the buyer pay?

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